U.S. Department of Energy

Information Management Conference

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“Recovering CIO”
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Agenda

- Open Source Trends
- Open Source in the US Federal Government
- Open Source and Sun
- Open Storage
- SOA / WOA & IdM
- Virtualization, Cloud, SaaS
- Desktop Virtualization

Perspectives

"[open source is] the most significant all-encompassing and long-term trend that the software industry has seen since the early 1980s."

IDC Group Report
August 2006

Recent Press on Open Source

- **CIO Magazine:** "The Recession will lead CIO's to move to open source"
- **eWeek:** "10 things IT organizations will do during The Recession"..."#1 Move to Open Source"
- **GCN:** "OSD Guidance Memo to move to Open Source"
- **GCN:** "Defense Appropriations language advocates a move to Open Source"

The Market is Moving to Open

2/3

of Clients Surveyed Using OSS in Mission-Critical Applications – June 2008

Gartner

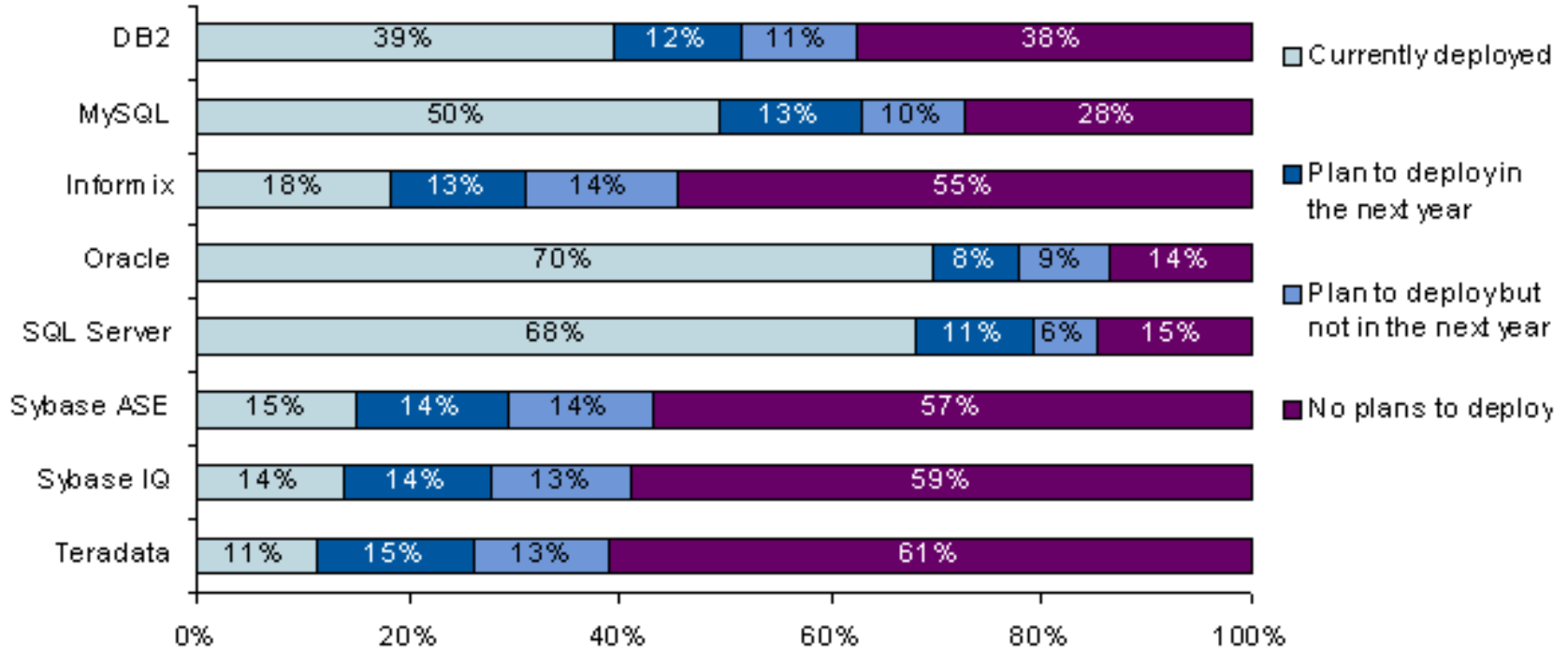
Survey Finds Growing Use of Open-Source Software for Mission-Critical Applications
- June 2008

FORRESTER®

"Open source adoption initially focused on the operating system and Web server tiers of the application platform stack, but early success widened the focus to include development tools, infrastructure components such as application servers and databases, and higher-level components such as portal servers and content management systems."

Open Source Adoption: Notes From The Field
- July 2008

Gartner on Enterprise Database Adoption

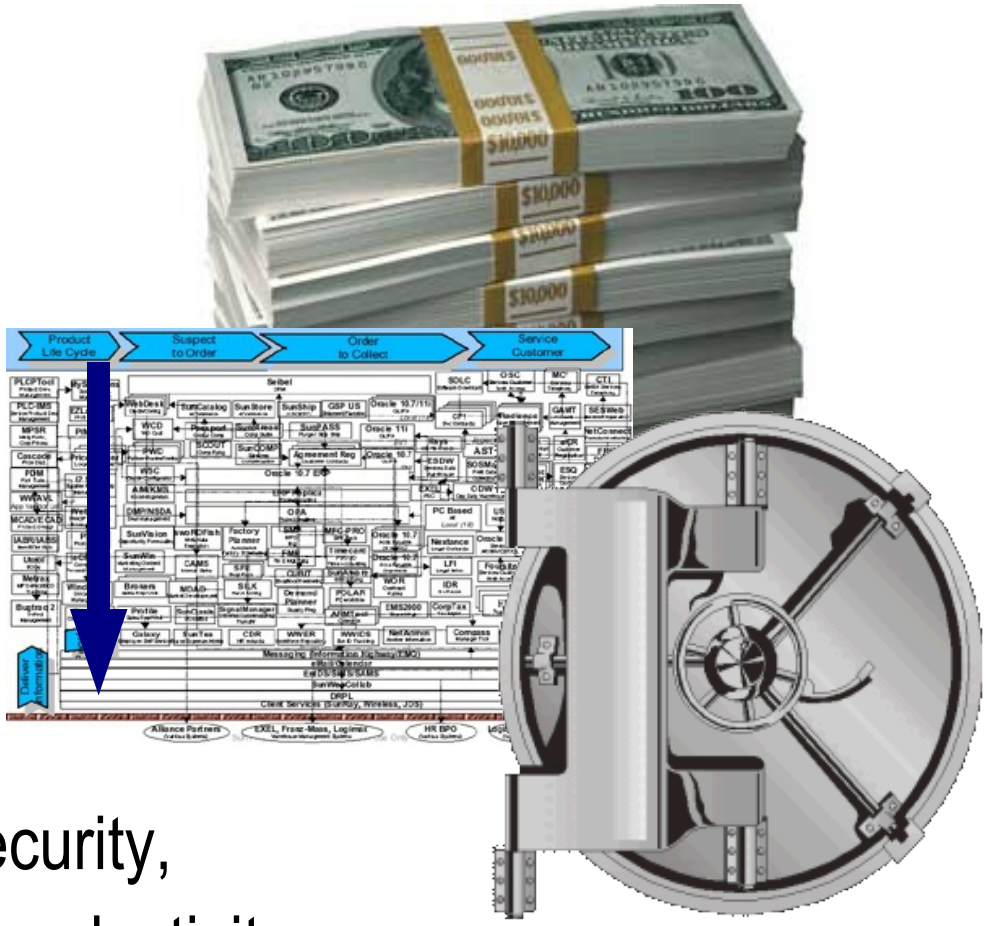


73% are Deploying MySQL or Are Planning to

Source: Gartner, The Growing Maturity of Open-Source Database Management Systems, 28 November 2008, ID# G00163259. Survey conducted with companies using some form of open-source in production.

CIOs and Program Leaders Want to...

- Reduce costs
- Reduce complexity
- Improve security, while increasing productivity
- Manage Compliance

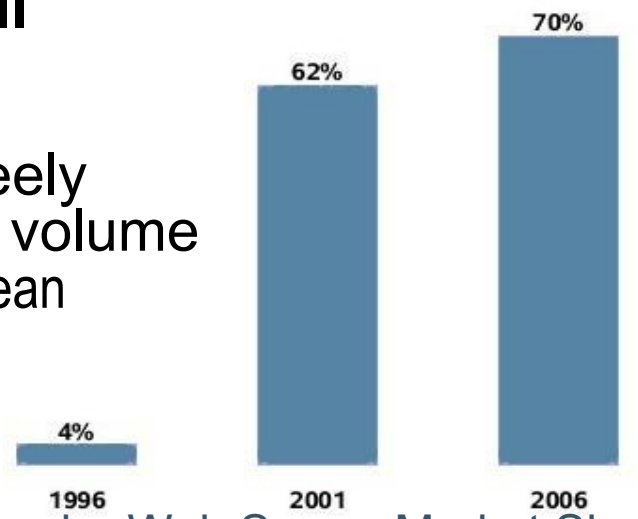


Business value – save money, more security, getting better information faster, more productivity

Open Source and Open Systems help with all of these

Open Source Landscape

- Some facts:
  - > 900,000 -the number of developers contributing to open source
  - > 30 and 11 -average age and years of programming experience of the average contributor
  - > 87% -estimated number of US businesses using open source – Banking, ISP, Gov Intell are leaders
- **Open Source equivalents exist for almost all software, also in the enterprise.**
- There is $16B -worth of open source software freely available (at production substitution costs). This volume doubles every 18-24 months. - UNU-MERIT / European Commission 2007
- Critical in developing economies(Brazil, Russia, India, China)



Apache Web Server Market Share

(source: Netcraft)

Open Source is Here to Stay!

Used Nearly Everywhere!

Used for Nearly Everything!

Why the Fed's Move to Open Source?

Enterprise IT Requirements

- ✓ Increased Security
- ✓ Reduced Procurement Time
- ✓ No lock-in or lock-out
- ✓ Reduced cost
- ✓ Increased quality

Developer Requirements

- ✓ See the source code
- ✓ Contribute fixes & features
- ✓ Fix bugs themselves
- ✓ Work together with each other to create solutions
- ✓ Government can engage to evolve the product - FMAC

Security:

- All proprietary software is written globally: Microsoft, Oracle, IBM, ...
  - Primary development locations:
    - India
    - China
    - Russia
  - Open Source and open development processes enhance overall security and visibility
  - Open Source, there is no place to hide

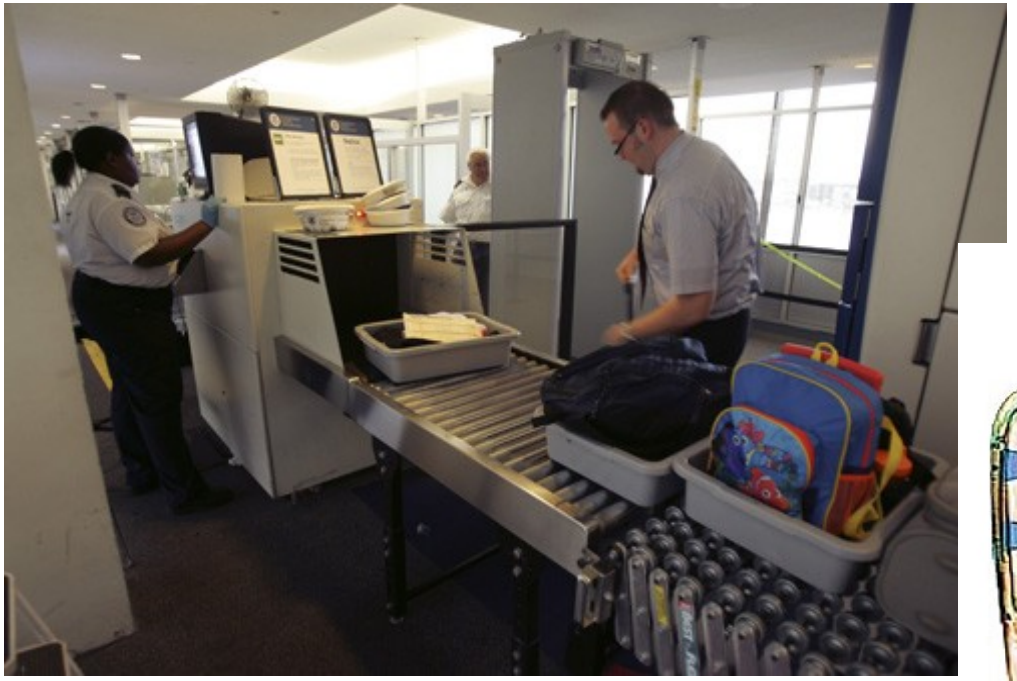
Security:

- Proprietary software may be reviewed and even certified by “Experts”**...However**
- A small number of experts can't compete with a community (160K – Solaris, 3M - Java)
  - Every time a Proprietary package is opened up, new vulnerabilities are found quickly (Solaris, Java,...)
  - Community vulnerabilities are usually fixed **before**

>

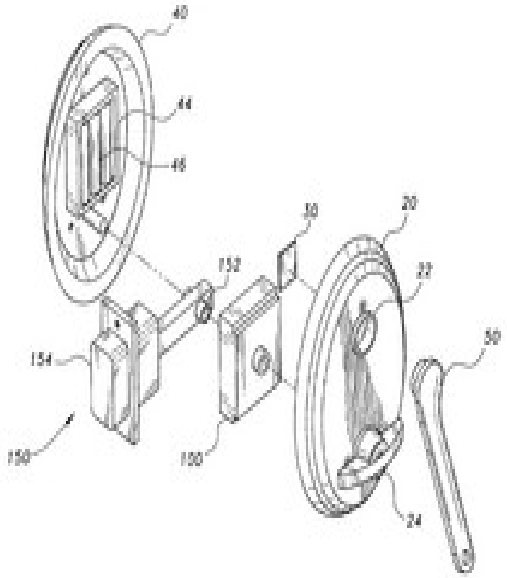
Security:

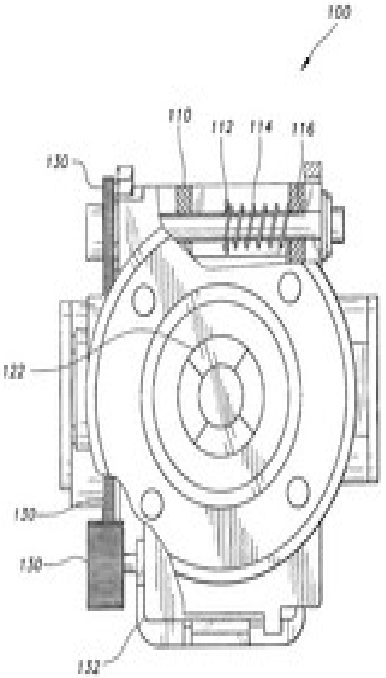
- Public / open source can be scanned with tools to improve overall security
- Proprietary vendors say “trust us”, Open Source code can be verified with third party tools

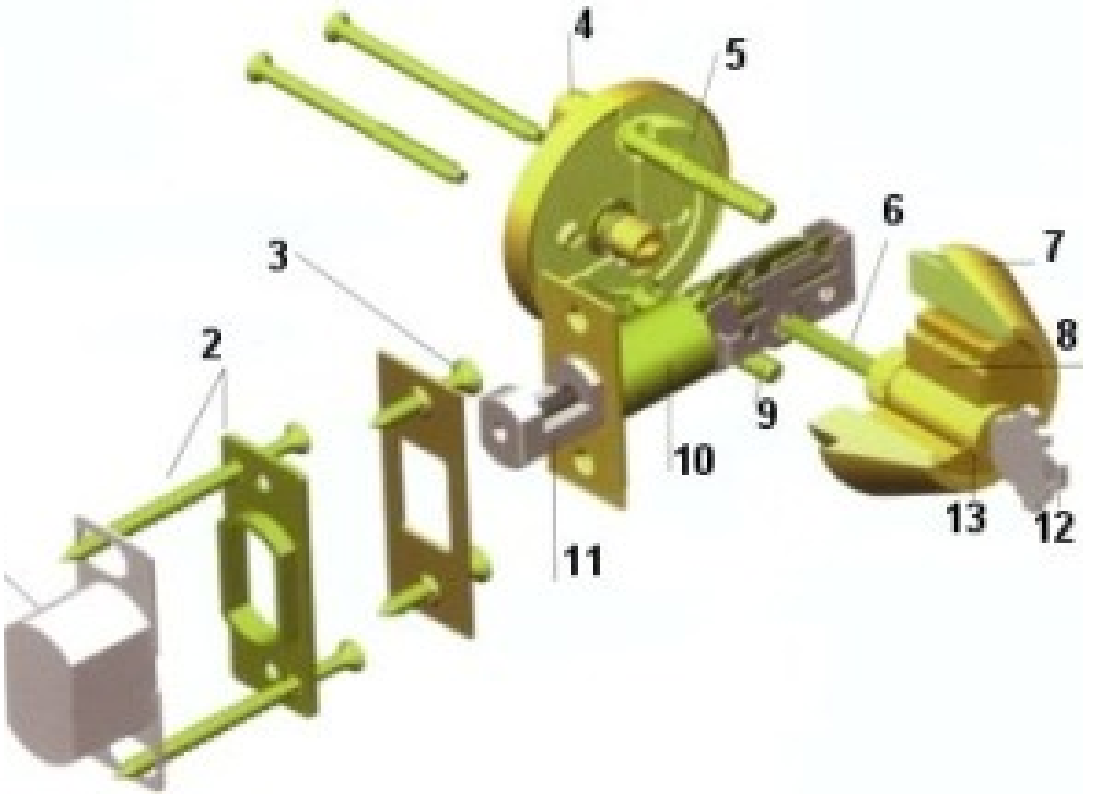


Security:

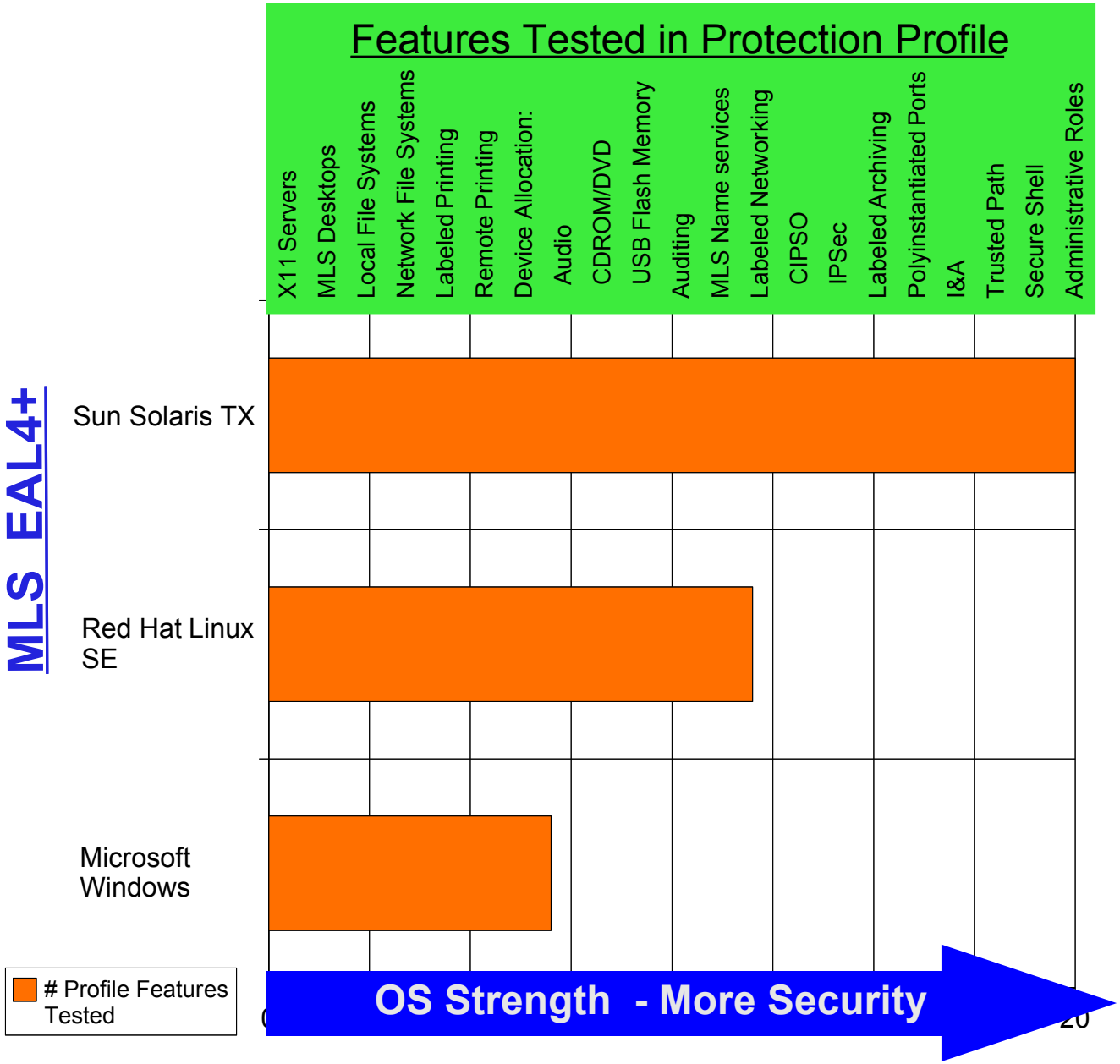
- Good Physical / Cyber Security is done in the open
  - Open Development means the security secret can't be in the code, it must be managed outside the code
  - Security through obscurity, isn't
  - Cryptography examples: RSA vs. Clipper Chip







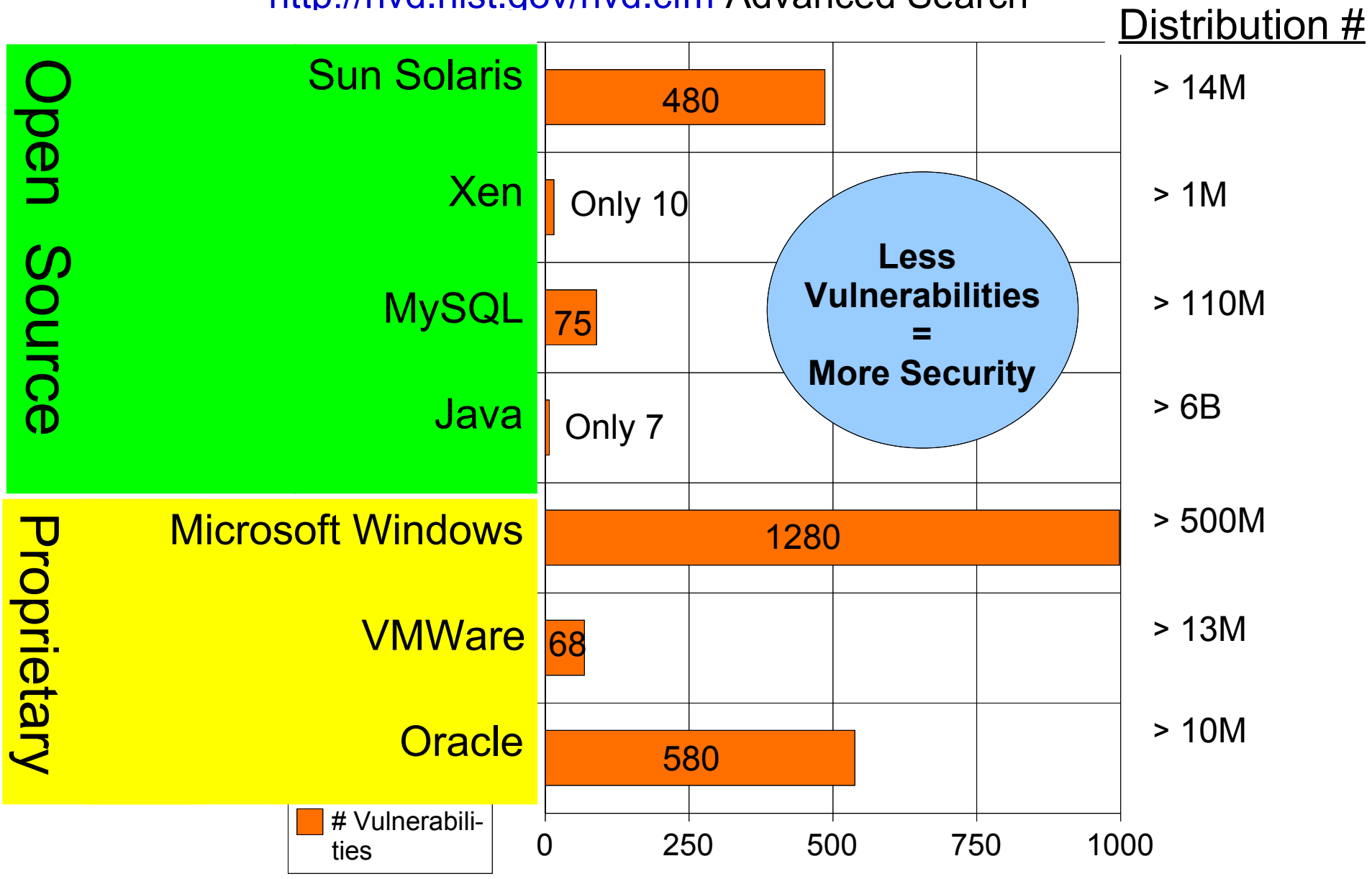
Common Criteria Certified Operating Systems



Enterprise Operating Systems with the Strongest protection profiles are open source

Software Vulnerability Data

National Vulnerability Database Cumulative Total
http://nvd.nist.gov/nvd.cfm Advanced Search



Reduced Procurement Time:

- Download, Verify, and Go
  - Don't have to wait for vendors to pilot
  - Don't need to go through a long procurement
  - Recent Examples:
    - HHS - ESB
    - CANES - ESB
    - Hours vs. Years
  - Can scale quickly when needed
  - Not held back by process

No Lock-in or Lock-out:

- Interfaces are usually open, but always publicly exposed
- Public interfaces allow interoperability
- Public code means support from:
  - Multiple vendors can provide support
  - Systems Integrators can provide support
- If vendor EOSL, others can support
- Investment protection beyond one vendor

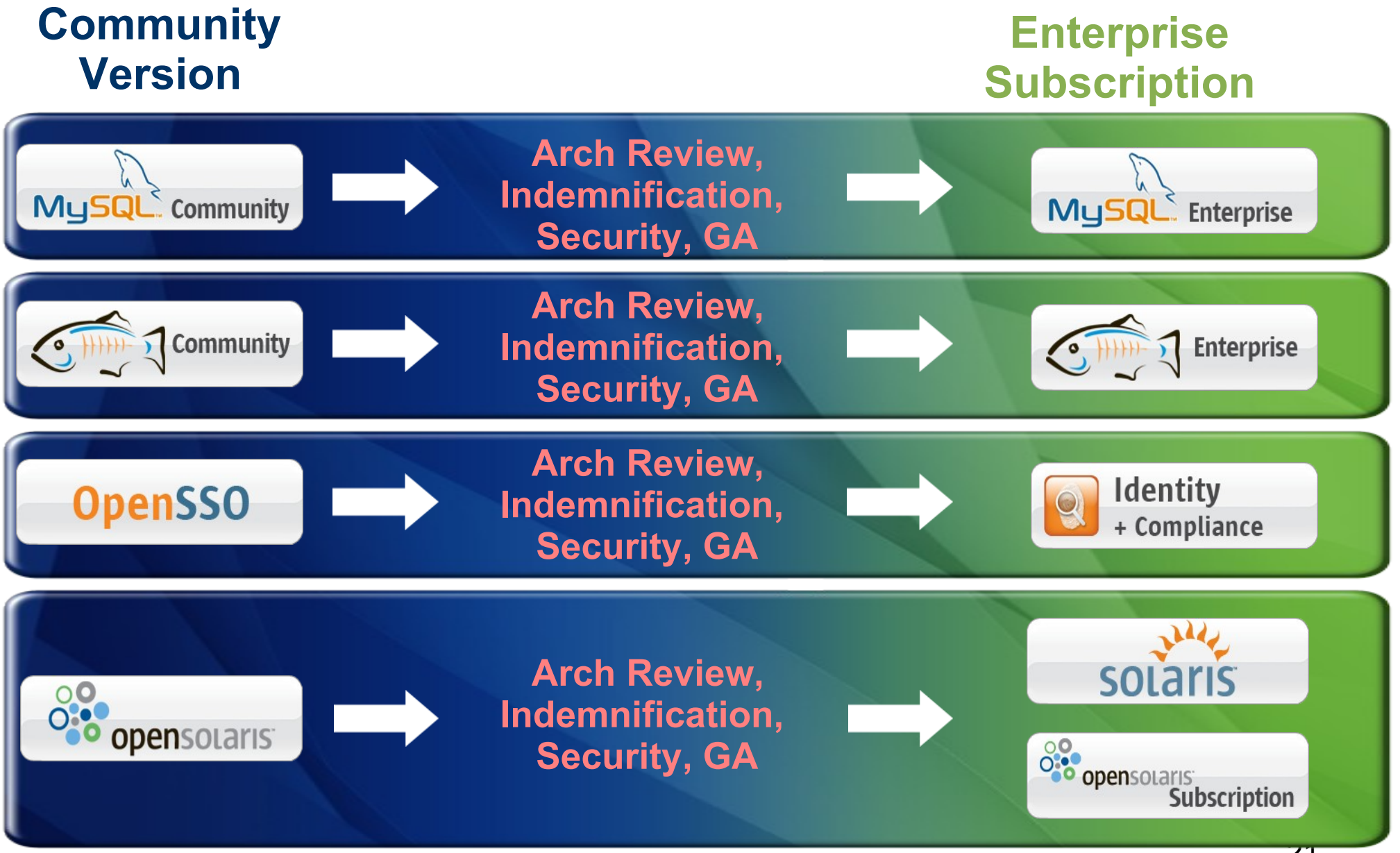
Reduced Cost:

- Zero cost of acquisition, but **NOT FREE**
  - > Open source Enterprise applications are available on nearly all operating system kernels, including Linux, Open Solaris, Apple OS X, and even MS Window
  - > There are Enterprise Ready Open Source applications for almost any need: OS, Middleware, Database, and Desktop
- **Often can be 90% of the functionality for 10% of the Cost**
- Faster acquisition and deployment also save cost
- Bottom Line: **Do more with less**

Increased Quality:

- Public and Community inspection improves the code
- Supported open source code goes through multiple inspections:
  - > Community inclusion / critical review
  - > Architecture review
  - > IP infringement / Indemnification review
  - > Backward compatibility check
  - > Security review
  - > QA /Test
  - > Productionalization / GA

Open Source Product Development



Government Engaging with Community to Develop or Influence Products:

- FMAC Project with Open Source Solaris
- SAM /QFS ILM extensions
- HHS /ESB – NetBeans Health objects
- SE Linux
- TE in FreeBSD / BSD
- TE in Java and MySQL
- Label aware ODF / OpenOffice
- World Wind 3D Java
- Many other programs

We want the work we do to be public domain

Sun's Strategy

Sun is only focused on one thing:

Enterprise and Web Scale Computing

The most secure, reliable, available, scalable, lowest cost per user, smallest power footprint, and most open.

From the Desktop to the Datacenter. That is all we do!

Good News, that is all the Federal Government does!

Things to remember about Sun:

Open Systems

- #1 provider of Open Systems in volume
- Everything we do follows Open Standards
- NO VENDOR LOCK IN

Open Source

- #1 contributor to Open Source community
  (in volume of code and products open sourced)
- Sold more supported copies of Open Source software than ANY other vendor

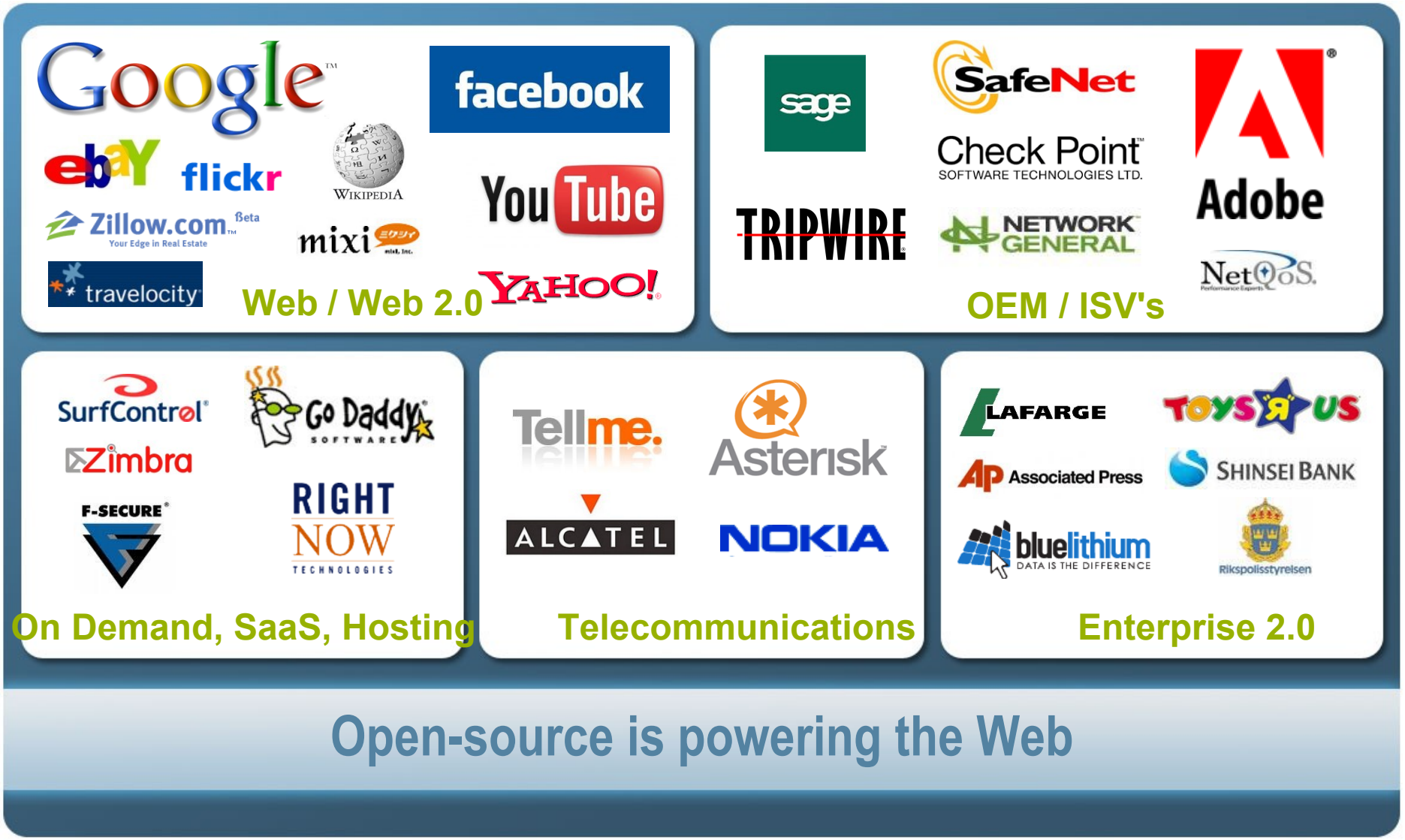
Perspectives

"Every software asset we produce is open source. If it isn't today, it will be pretty damn quickly."

Jonathan Schwartz
CEO, Sun Microsystems
January 2007

Even our HW is Open Source!

Sun's Open Source Industry-Leading Customers



Open-source is powering the Web

Essential Technologies for the Network

Comprehensive **Open** Portfolio Delivering Customer Choice

pts.

Community Perspectives

"I think Sun...has contributed more than any other company to the free software community in the form of software. It shows leadership. It's an example I hope others will follow."

Richard Stallman
Free Software Foundation

Sun's Contributionto Linux

Rank	Company	Estimated $ value
1	Sun Microsystems Inc	404 m
2	IBM Corp	116 m
3	Red Hat Corp	76 m
4	Silicon Graphics Corp	61 m
5	SAP AG	60 m
6	MySQL AB	45 m
7	Netscape Communications Corp	41 m
8	Ximian Inc	39 m
9	RealNetworks Inc	35 m
10	AT&T	34 m

EstimatedSubstitution Cost of Sun's contributionto Debian GNU/Linux

includescodein
GNOME
Linuxkernel
Mozilla
OpenOffice.org
X.org
and otherprojects

Source: UNU-MERITreportfortheEuropean Commission
"Economicimpactof FLOSSon innovationand competitivenessoftheEU ICTsector"
January2007

Sun's Contributionto FOSS

Project	Estimated $ value
OpenJDK (Java SE)	399 m
GlassFish (Java EE)	193 m
Mobile & Embedded (Java ME)	248 m
OpenSolaris	236 m
NetBeans	75 m
OpenSPARC	408 m
GridEngine	24 m
Open SSO	21 m
LookingGlass	2 m
Sun's Contribution to GNU/Linux	404 m
Total	**2 bn**

EstimatedSubstitutionCost Sun's contributionto Free and Open Source Software

not exhaustive:
not all projectscounted
some Java SE code stillto be released in 2007
Method:COCOMO1

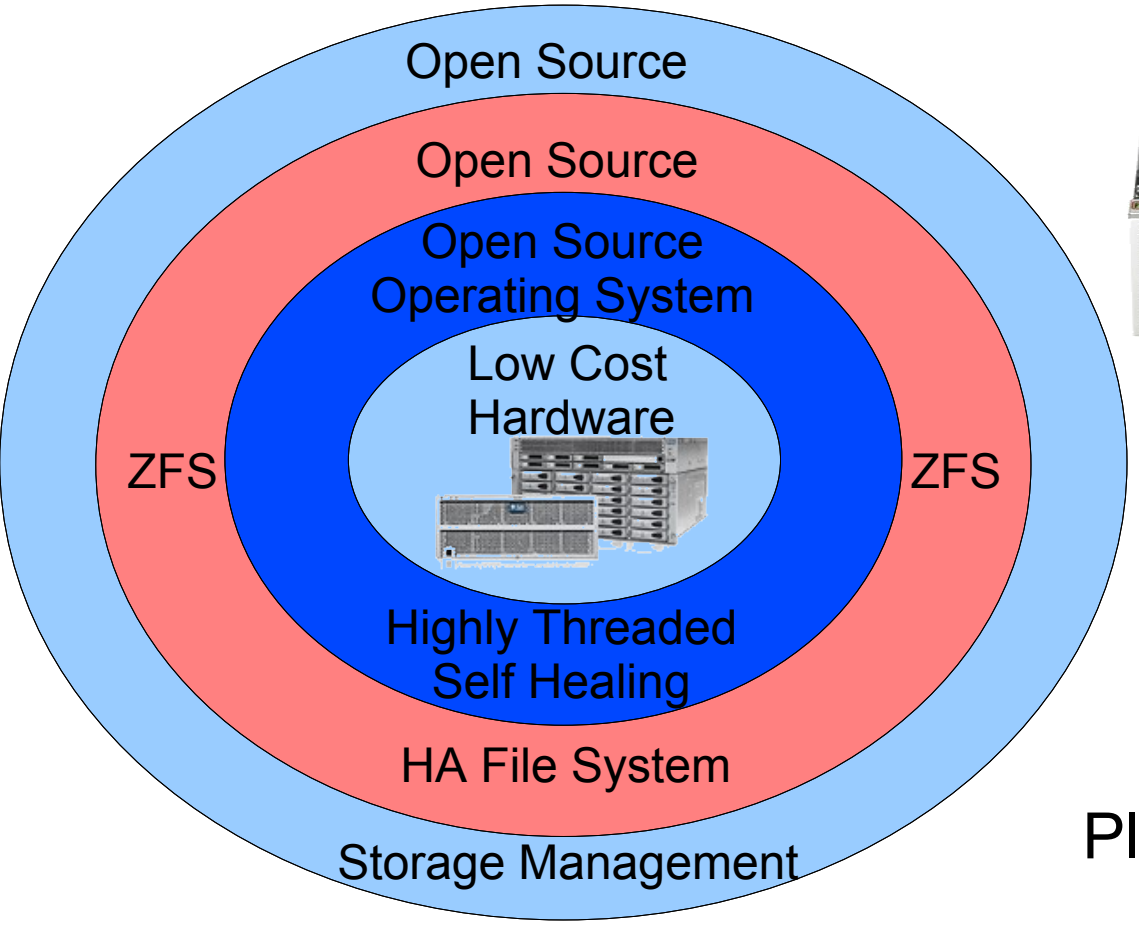
These numbers before acquisition of MySQL

Why Use Sun Open Source Software?

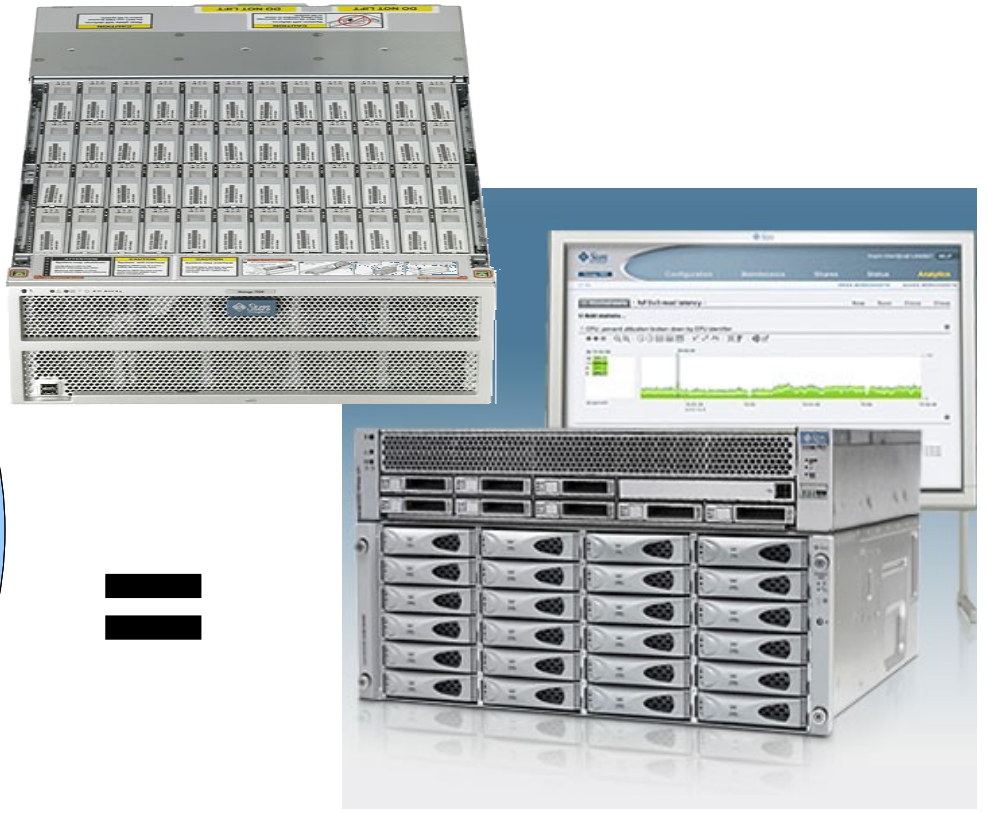
- Sun believes open source is **first class software**
  - > Same quality processes for open and proprietary code
  - > Sun offers warranty and **indemnification** for software built on open source projects
  - > **Gartner's "Magic Quadrant" Products**
- Sun knows its code
  - > Huge diligence around open sourcing
  - > We require signed contributor agreements
- Sun protects its code
  - > Moves quickly on legal threats
  - > We demand reciprocal patent grants

Open Source Storage

Combining Open Source Software with Low Cost Hardware



Yields High Performance HA Storage at ¼ the Cost



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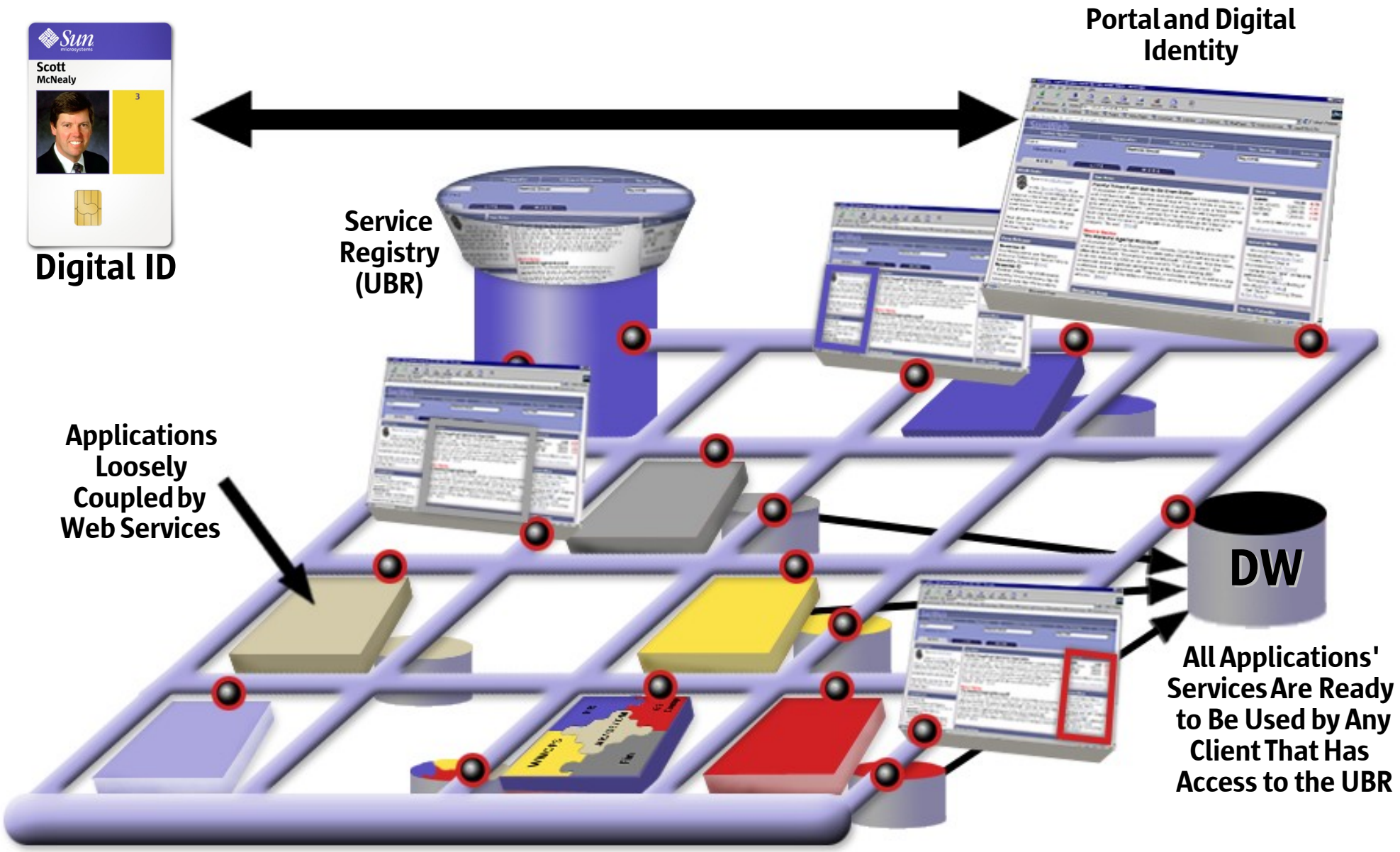
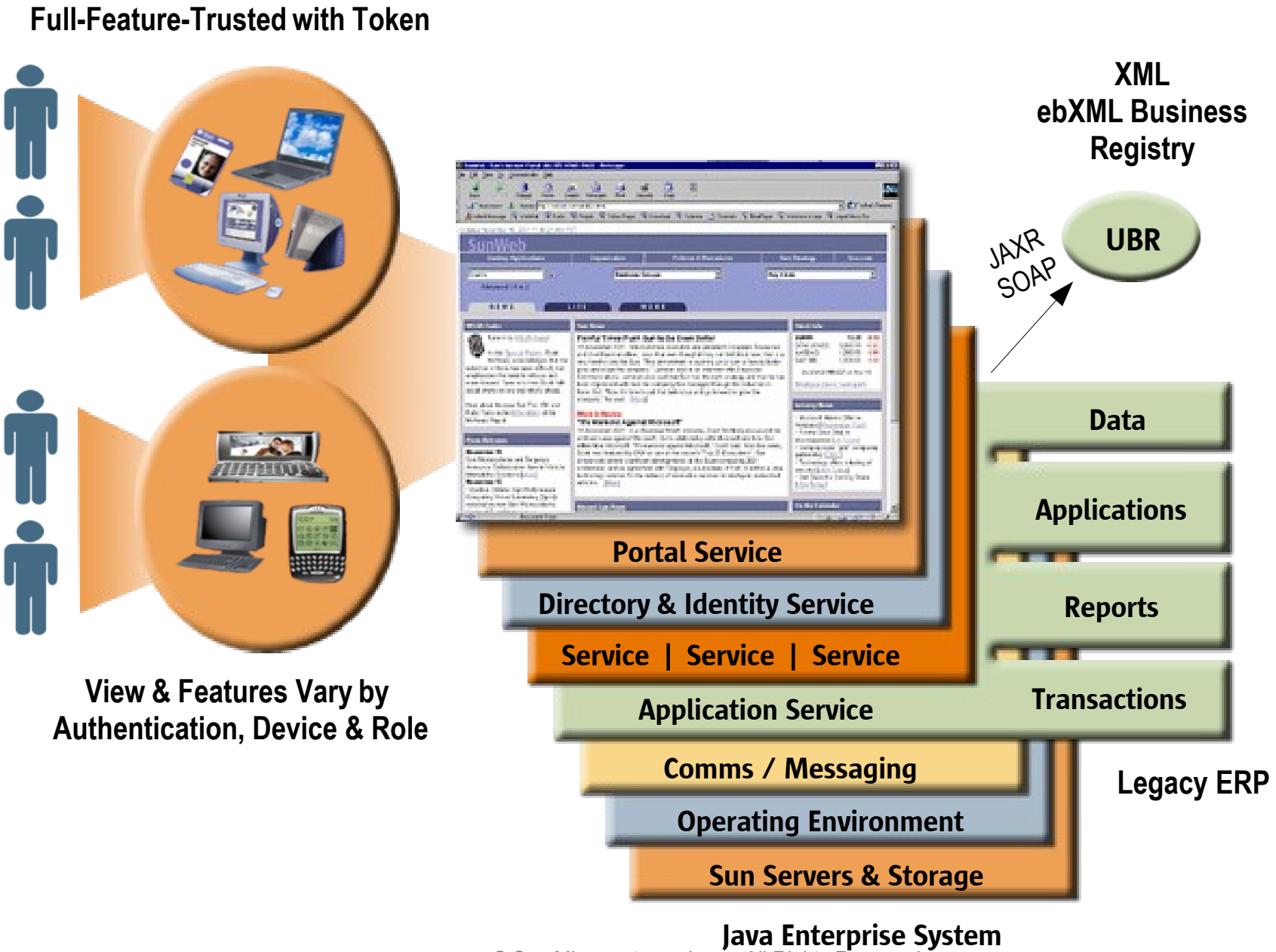
Plus all the advantages of Open Source

Web Services Architecture



*-Prise

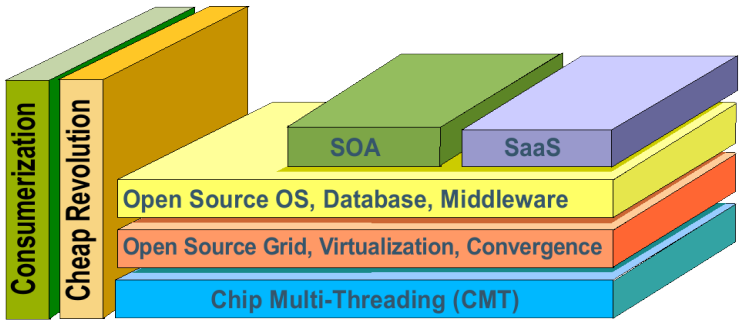
Dynamic Portal Service Delivery



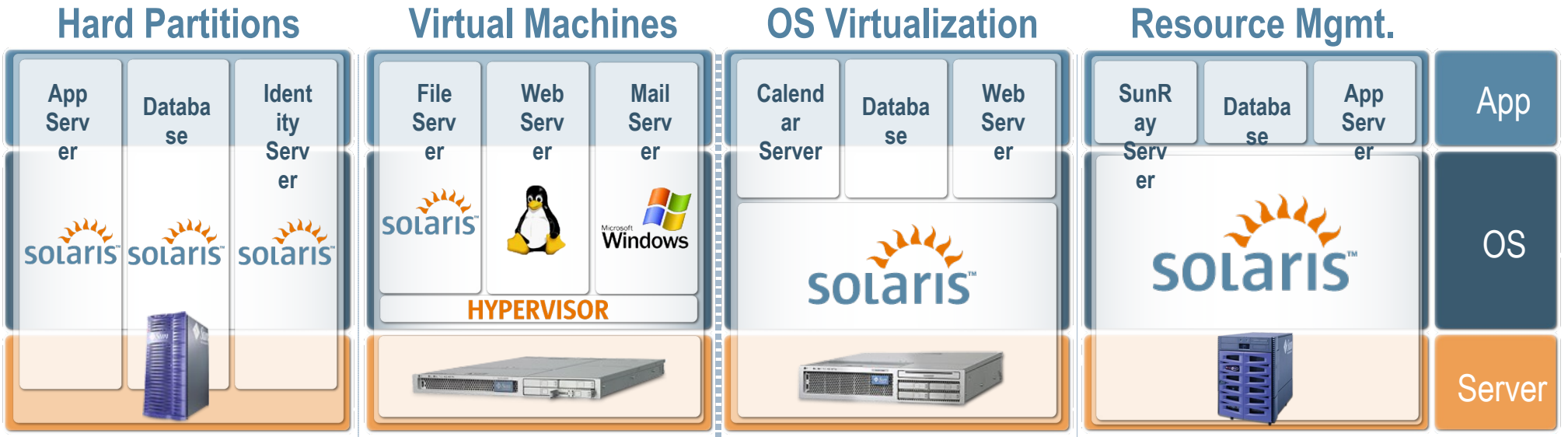
Enterprise SOA - ESB

Reusable Business Services and Components

- Integrated software design
- Aligns business with IT
- Composite applications
- Open Standards
- Open Source



Different Levels of Virtualization - xVM



Multiple OSes ← Trend to flexibility

Single OS ← Trend to isolation

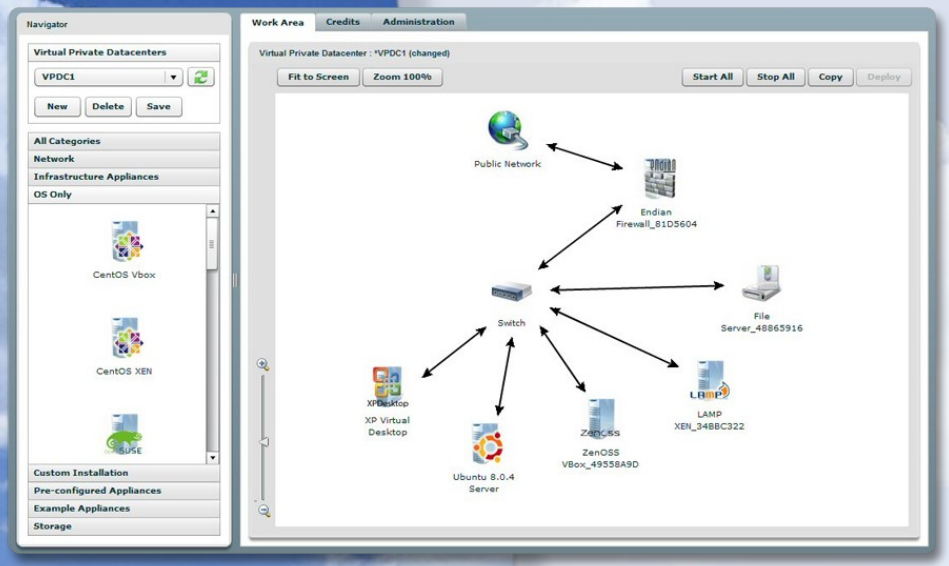
- >Very High RAS
- >Very Scalable
- >Mature Technology
- >Ability to run different OS versions

- >Ability to live migrate an OS
- >Ability to run different OS versions and types
- >De-couples OS and HW versions

- >Scalable, low overhead
- >Single OS to manage
- >Divides system and app administration
- >Fine grained resource management

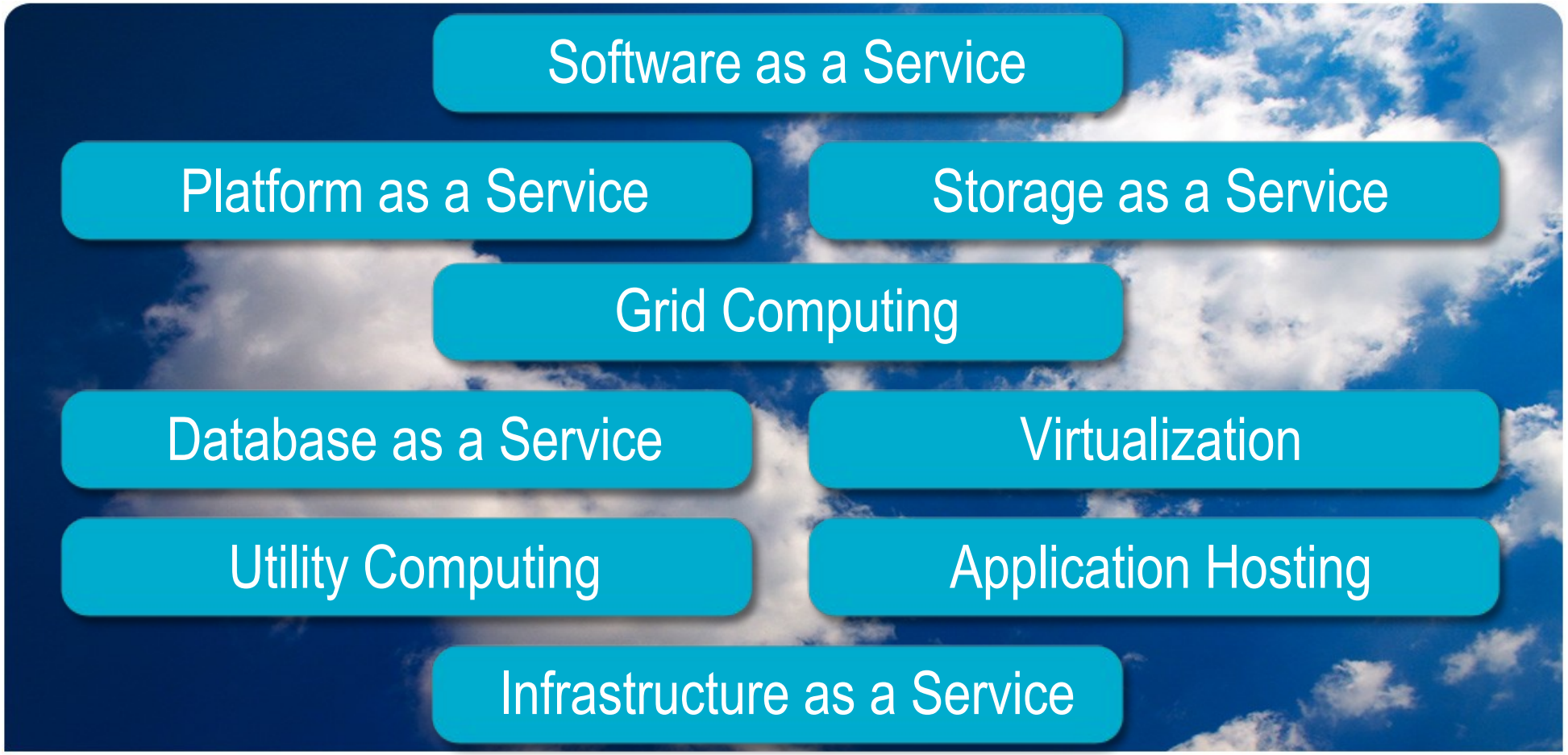
- >Very scalable and low overhead
- >Single OS to manage
- >Fine grained resource management

Virtual Datacenter (VDC) Model



- Design application from pre-built components using drag-and-drop
- Deploy to cloud
- Monitor, manage and reconfigure
- Compatibility with programmatic APIs
- Encapsulate system architecture of an application
- Ability to model, save and deploy entire system

Everyone is talking about Cloud Computing



All Clouds Share Key Traits

Cloud Computing Layers

Software as a Service

Applications offered on-demand over the network (salesforce.com)

Platform as a Service

Developer platform with built-in services (Google App Engine)

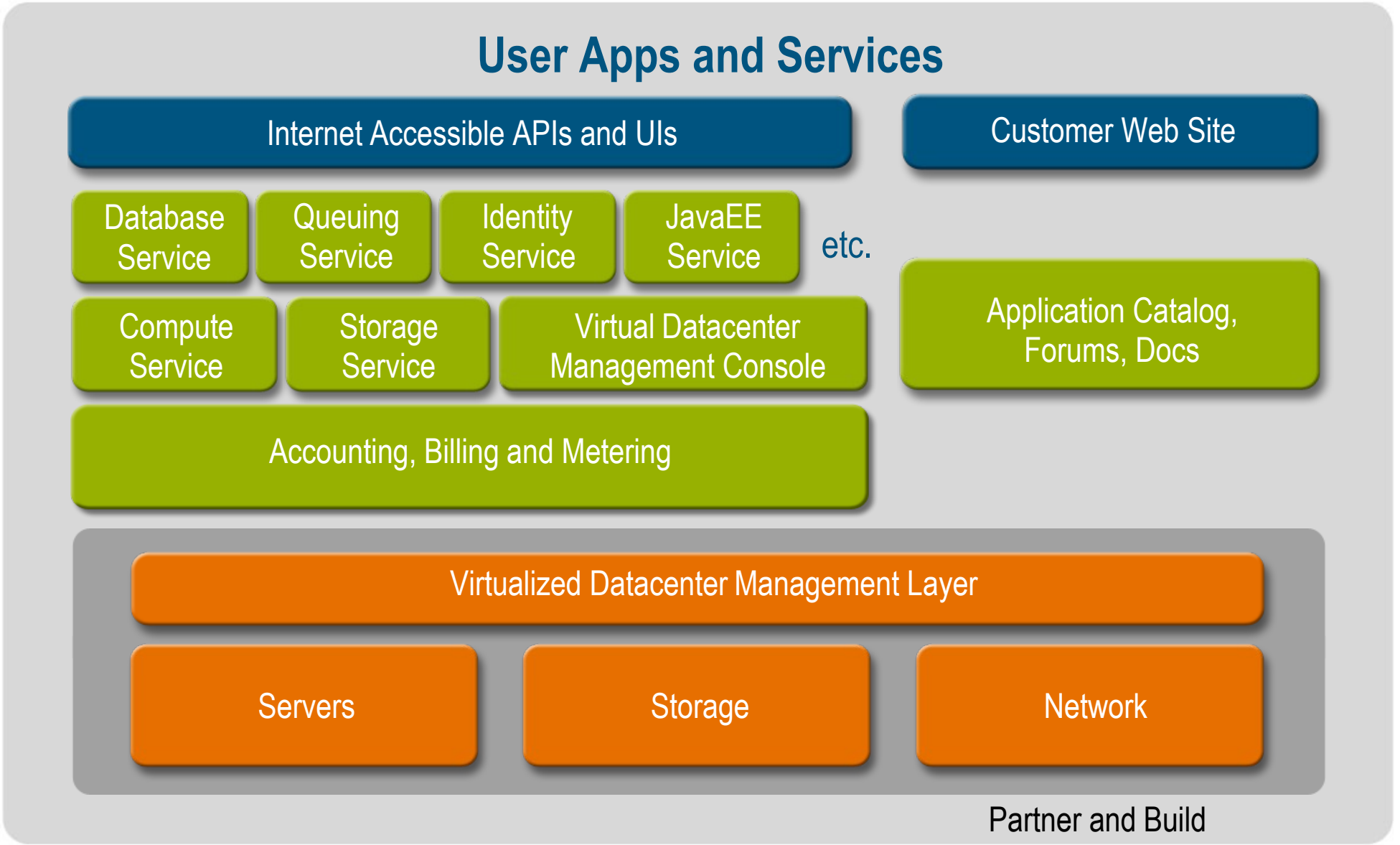
Infrastructure as a Service

Basic storage and compute capabilities offered as a service (Amazon web services)

Public vs. Private Clouds

Public	Private	Mixed
		
Pay as you go, multi-tenant applications and services	Cloud computing model run within a company's own datacenter	Mixed usage of public and private clouds according to application

Cloud Architecture– Future



Application and Desktop Evolution

From Simple Terminal Applications to Rich Network Desktops

Simple Terminal Applications & Devices

Rich Apps Running Locally

Rich Apps Running Locally & From Network

Rich Apps, All From Network

The Network Is the Computer™

Sun's Client Environment

Ultra Thin

Ultra Thick

Really Dumb

PDA

Cell

J2ME/Java ES/CDS

Work at Home
or Office Connected
to a Network

70%

Thick

Mostly
Connected

28%

2%

Really Smart

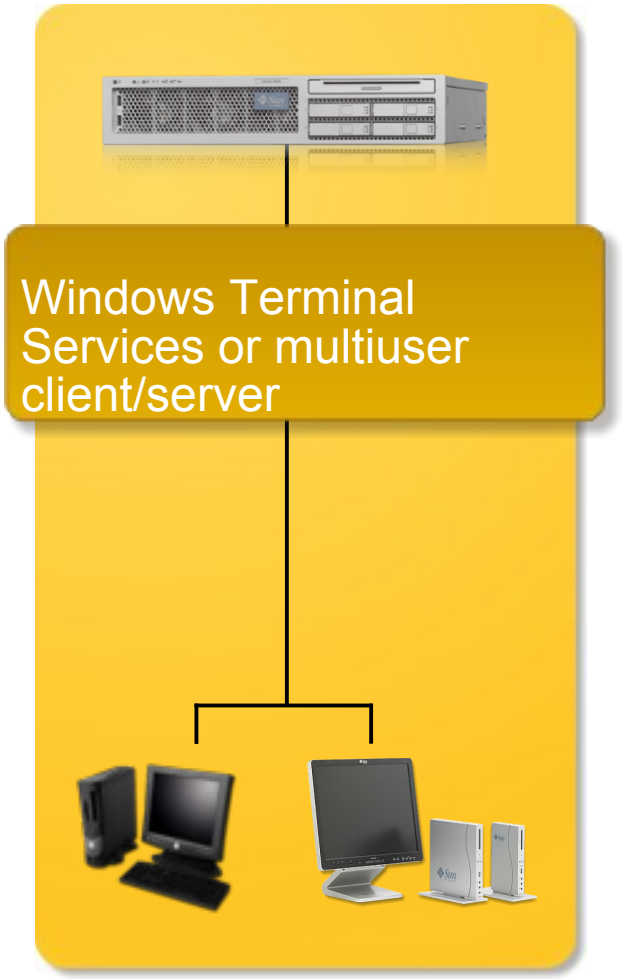
Network Driver

Like
a
TV
Set

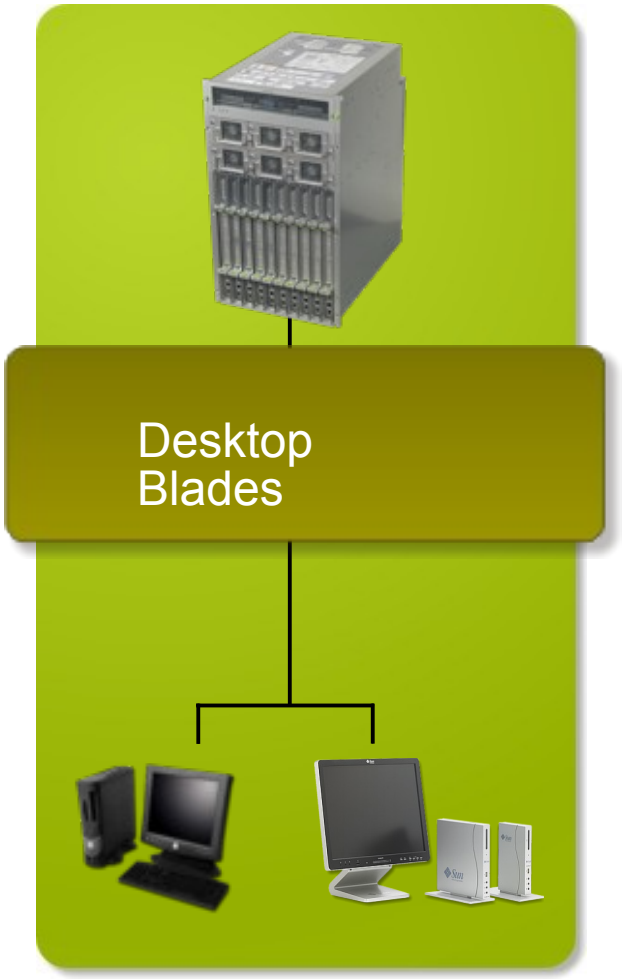
Java Desktop - Open Source

Microsoft Windows

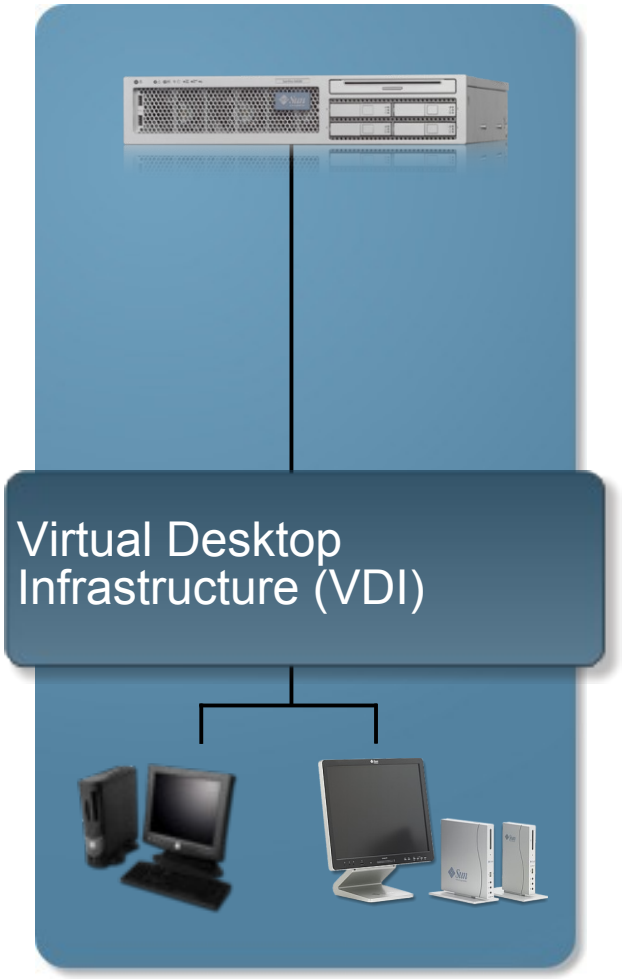
Virtual Desktop Options



Multiple Users Per OS



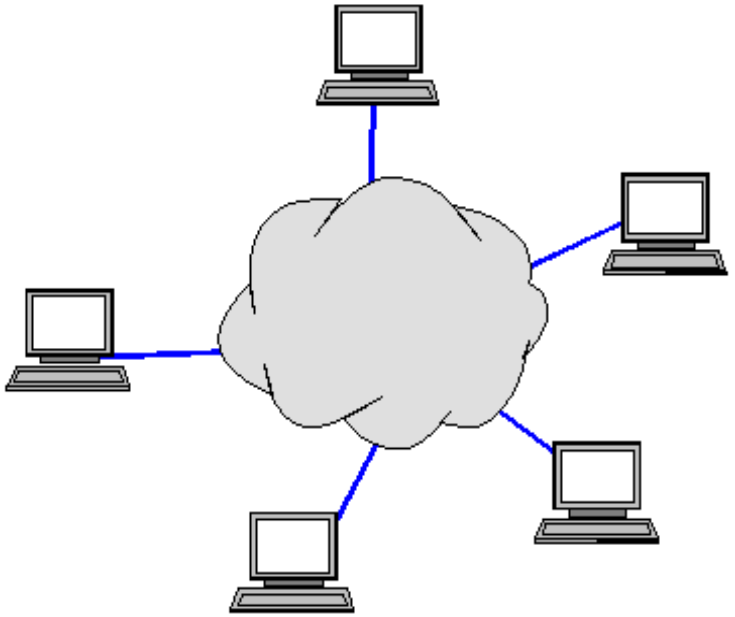
Each User With Dedicated Blade



Each User With Dedicated OS

What is Sun Ray Stateless Technology?

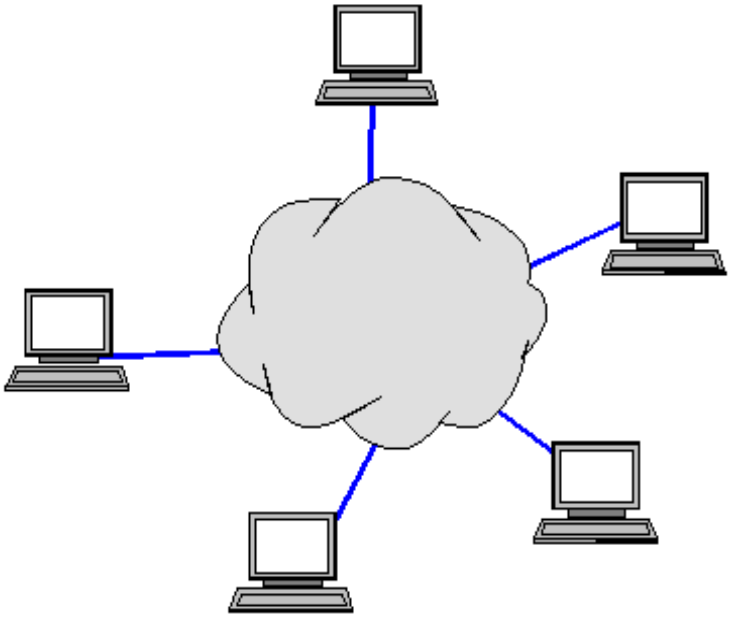
Display over IP – Just like a TV



Content Broadcast From a Cloud: No Local Logic or Data

What is Sun Ray Stateless Technology?

Display over IP – Just like a TV



Desk Top Broadcast From a Cloud: Desktop as a Service DaaS

Choose Your Desktop

Display Solaris, Windows, or Linux all on the same device

opensolaris™

Microsoft Windows

TraditionalDesktop Model

Desktop “Management”

The Solution

Desktop **Managed**

World Class Windows Desktop

- Full screen Windows desktops on Sun Ray clients
- Windows XP, Windows Vista, or Windows Server
- Two-factor smart card authentication to Windows
- Hot desk Windows sessions between devices
- Only 4 watts
- 40K managed by 1 person
- 12 year expected life

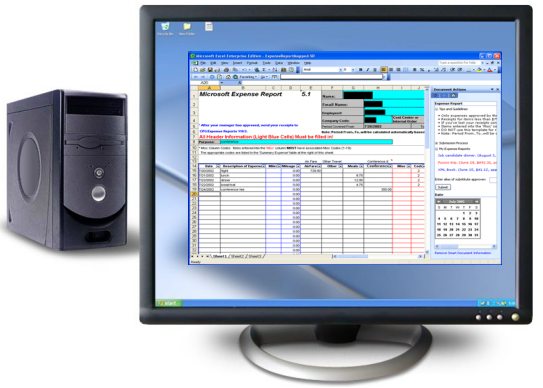
Microsoft Windows

Seamless User Experience

Applications Integrate with Your Local Environment

Ability to access remote files and applications

Ability to print from local and remote apps



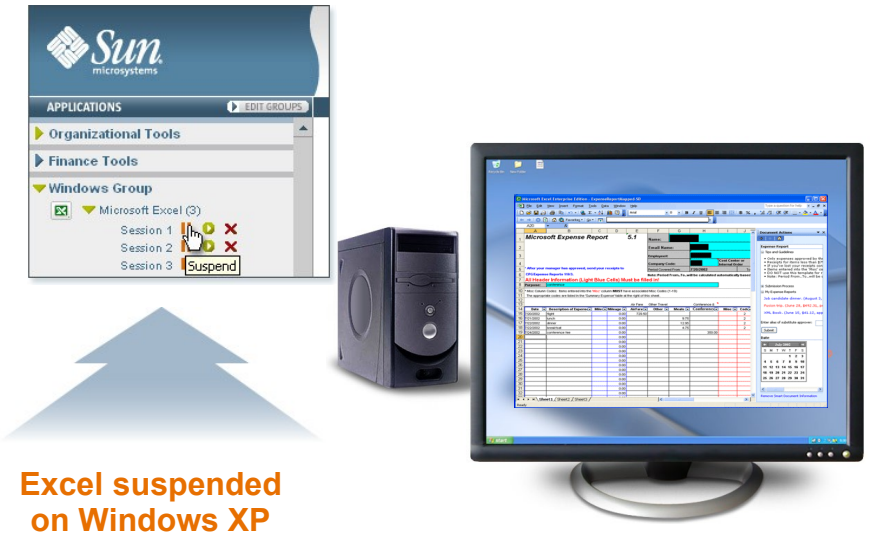
Ability to launch applications from Start menu

Ability to access local files and applications

Apps | Access | Local Environment

Suspend & Resume

Applications Integrate with Your Local Environment



Excel suspended on Windows XP

Excel resumed on Sun Ray

Suspended Session

Resumed Session

U.S. Department of Energy

Information Management Conference

Bill Vass
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“Recovering CIO”
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